Synthetic Training Environment: Army's Future Training Environment

by COL Jay Bullock

After a year-long tour in Iraq, my unit was at Camp Virginia, Kuwait, waiting to start the long process of returning to the United States. As we reflected on our time as a military transition team in Baquba, we thought about how to capitalize on our experiences and hard lessons-learned, and use them to our advantage for the next rotation.

Of course the unit would train at our installation's urban-operations facility; conduct company, battalion and brigade certification exercises; live-fires; and the mandatory National Training Center (NTC) rotation, but how could we ensure the unit was ready for the enemy we would face? Since our deployment, Soldiers' experiences prompted Army senior leaders to assess the current training aids' ability to ensure readiness. This article is an assessment of those and a description of the future Army training environment.

Our current simulations do not allow us to train as we fight or train where we fight. The Integrated Training Environment (ITE), the Army's current training environment, has made significant strides providing a training capability but is a mix of different non-systems training devices that were all developed separately over the last 35 years. They are connected by live, virtual, constructive integrating architecture that can only deliver a semi-integrated training environment.

This partial integration of separate systems results in a very complex federation of capabilities that are expensive and can't keep pace with technology, thus can never fully train our formations to meet current and future threats. ITE lacks enough realism, interoperability, affordability, reliability, adaptability and availability necessary to prevent, shape and win as a part of the joint force in the multi-domain operational environment (OE).

ITE also cannot adequately replicate emerging threats and conditions such as electronic warfare, cyber, space, megacities and simultaneous operations in a multi-domain OE. Terrain and database development is extremely costly and time consuming, currently taking up to nine to 12 months for engineers to deliver new terrain. ITE requires extensive lead times – up to 120 days – to plan, prepare and execute a training exercise due to complex database set-up and integration between environments.

As many of the Soldiers in the Army have experienced the regimen of deployment, followed by a short dwell, followed by another deployment, and so on and so on and so on, our inability to represent the complexity of the OE translates into increased risk during the initial days of a deployment. As a unit prepares to deploy, it conducts training at its home station, followed by some kind of combat-training center (CTC) rotation to become certified on their core tasks before deployment. Unfortunately, neither our home-station training nor CTCs truly represent the complexities of the OE our units find themselves in once they arrive in theater.

I am not suggesting the training is bad – on the contrary, it is very good – but there are levels of complexity and gaps in realism like weather, terrain, altitude, human dimensions, cultural, religious, enemy and, of course, fear, which all can be represented more accurately. This led to what was commonly referred to a few years ago as "the first 90 days," which was correctly described as the most dangerous time for Soldiers. The enemy capitalized on this transition period as units acclimated to their new environment and conducted aggressive attacks on our formations.

These training gaps are what the Synthetic Training Environment (STE) team has been focused on for the last few years: reducing these 90 days, representing a realistic environment and eliminating ITE's disadvantages.

The Army's future training capability is STE. STE will be a single, interconnected training system that enables units from squad through Army Service Component Command (ASCC) to train in the most appropriate domain: live, virtual, constructive and gaming – or in all four simultaneously. The training capability will enable Army units and leaders to conduct realistic multi-echelon/multi-domain combined-arms maneuver and mission-command training, increasing proficiency through repetition.
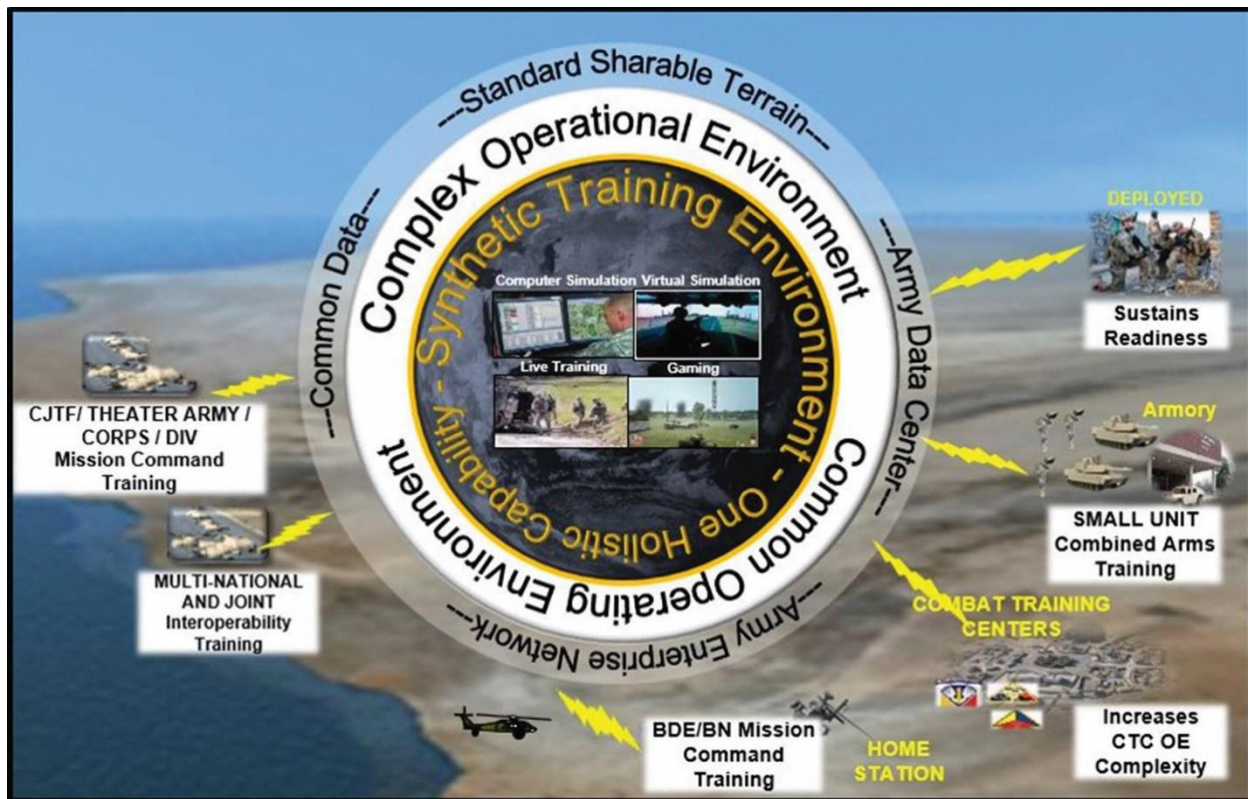
Figure 1. STE relationships.

Imagine the power of a program that allows the entire unit to immerse itself into its future OE multiple times before it deploys. With STE, that is exactly the type of training we want Army units to go through before they leave the safety of their home station. A Soldier, squad, platoon, company or higher echelon could conduct virtual reconnaissance, rehearsals and exercises on the terrain in which they are about to go fight.

Now imagine even further that we could execute missions in near-real-time that the current deployed unit had just executed against the same enemy. STE will give Army units the opportunity to do this and more. Taking this concept one step further after a unit deploys, imagine taking this program into theater to conduct reconnaissance, planning and rehearsals for current and future operations. Simultaneously, units at home station could participate (passively) in the deployed unit's mission planning and rehearsals by meeting them in STE virtually.

If we apply another example to the regionally aligned forces (RAF), STE could help those units train for current operations at their RAF locations and maintain readiness with their parent organization at home station. The concept envisioned is while a unit is task-organized, the unit's organic components can meet inside STE virtually and conduct training to maintain readiness on their collective and mission-essential-task-list tasks, thus allowing them to more quickly move into live training after they physically come back together.

STE will deliver the next generation of synthetic collective trainers for armor, infantry, Strykers, combat-aviation brigades and other platforms. These air and ground Reconfigurable Virtual Collective Trainers (RVCT) will be low-overhead and less costly than legacy collective simulators. This enables the Army to simultaneously train brigade task forces and below on tasks required to accomplish their warfighting functions. This multi-echelon collective training will be delivered to geographically distributed warfighters at the point of need for both current and future forces.

What we envision is a capability that allows all units to conduct collective training in a virtual environment from squad to battalion level. These virtual trainers would be transportable to allow units to take the trainer with them to the point of need, which could include company orderly rooms, home-station armories and/or the unit's deployed location. The trainers are reconfigurable, which would allow them to be used as a mechanized-infantry

platoon one day and a tank platoon the next. The flexibility comes from the use of open-architecture One World Terrain (OWT), augmented/virtual reality and Universal Serial Bus-derived controllers that allow for quick and simple reconfiguration.

A potential-use case for the RVCTs is to be used by a mechanized-infantry company to conduct collective training before it deploys to NTC. As the unit goes through the orders process, it is determined that this company will be task-organized with a tank platoon and during execution of a deliberate-attack mission at NTC will receive an assortment of enablers to conduct that mission. That tank platoon as well as enablers would be able to use their RVCTs to meet the company team in OWT to conduct rehearsals and virtual exercises before deploying to the CTC.

Building on this use case, imagine this same mechanized-infantry company is now deployed to Estonia as part of the RAF in Europe. It would take its RVCT with it as a way to conduct exercises and mission rehearsals. Again, the company is task-organized as it deploys to Europe. That company team would be able to conduct exercises as well as maintain readiness by being able to link to its detached mechanized-infantry platoon to conduct virtual exercises. This ability to conduct training as a pure mechanized-infantry company has positive implications on its ability to maintain its readiness.

Of course, there is never a replacement for live training; however the unit's ability to train together in a virtual environment will help mitigate its time apart and lessen the amount of time it will need to train together once redeployed.

ITE was never able to achieve this level of effectiveness in training units prior to deploying to Iraq and Afghanistan. We were unable to provide this level of realism in our legacy virtual or constructive trainers. However, we have learned those lessons and understand we need to break the paradigm of how we train in simulations. We have the ability both as an organization and the technology to create a new environment that provides a capability to train from the squad to ASCC level. STE provides our units the ability to train as they would fight where they would fight. STE has the power to revolutionize how the Army trains and maintains readiness.

COL Jay Bullock is chief of Capability Development, STE cross-functional team, Fort Leavenworth, KS. Previous assignments include Training and Doctrine Command Capability Manager-ITE, Combined Arms Center-Training, Fort Leavenworth; Security Force Advise and Assist Team, 4/4 Brigade Combat Team (BCT), Kunar, Afghanistan; brigade executive officer, 3/4 BCT, Operation Iraqi Freedom (OIF) 10, Nasiriya, Iraq; S-3/executive officer, 4-10 Cavalry, OIF 07-09, Baghdad, Iraq; and military transition team, 3/4 BCT, OIF 05-06, Khalis, Iraq. His military education includes Command and General Staff College. COL Bullock holds a bachelor's of arts degree in public administration from Stephen F. Austin University and a master's of arts degree in public administration from Western Kentucky University.

Acronym Quick-Scan

ASCC – Army Service Component Command
BCT – brigade combat team
CJTF – combined joint task force
CTC – combat-training center
ITE – Integrated Training Environment
NTC – National Training Center
OE – operational environment
OIF – Operation Iraqi Freedom
OWT – One World Terrain
RAF – regionally aligned force
RVCT – Reconfigurable Virtual Collective Trainer
STE – Synthetic Training Environment